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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/693,076

10/24/2003

Ronghua Wei

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EXAMINER

LAVILLA, MICHAEL E

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

10/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/693,076

Applicant(s)

WEI ET AL.

Examiner

Michael La Villa

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) 78-82 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 45, 48, 49, 51-54, 56, 57, 60, 61, 63, 66, 67, 73 and 85-92 is/are allowed.
- 6) ☒ Claim(s) 28, 31, 32, 35, 36, 38-40, 69-72, 83, and 84 is/are rejected.
- 7) ☒ Claim(s) 28, 31, and 84 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>20071014</u> |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20070724</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 28,31,32,35,36,38-40,45,48,49,51-54,56,57,60,61,63,66,67,69-73 and 78-92.

DETAILED ACTION

Claim Objections

1. Claim 28 is objected to because of the following informalities: Regarding Claim 28, the agglomeration of characters at line 4 between the words "about" and "micrometers" does not have any recognized meaning. While it is understood that the intended meaning was "5," an amendment should be made to render this intended meaning. Appropriate correction is required.
2. Claims 31 and 84 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Regarding Claim 31, in view of the intended recitation that Claim 28 should recite "5" microns, it is unclear how Claim 31 is further limiting as Claim 31 presents the same thickness requirement as Claim 28. Regarding Claim 84, it is unclear how Claim 84 is further limiting of Claim 83. Claim 83 requires that the precursor be silane, i.e., SiH_4 , whereas Claim 84 requires that the precursor be trimethylsilane, $(\text{CH}_3)_3\text{SiH}$.

Double Patenting

3. Applicant is advised that should claims 36 and 38 be found allowable, claims 35 and 39, respectively, will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a

slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). The subject matter of Claims 35 and 36 appears to be identical, and the subject matter of Claims 38 and 39 appears to be identical.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:
5. The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
6. Claims 69-72 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The subject matter of Claims 70-72 cannot be located in the Specification. Applicant is requested to identify support or otherwise justify support to overcome the rejection. Applicant has explained that support for Claim 69 is found at page 8, lines 18-20 of the Specification. The Specification at this location explains that amorphous carbon coatings may be formed by silicon-containing diffusion pump fluid gaseous precursor materials. However, the discussion does not teach that a resulting amorphous carbon coating of 32 atomic percentage hydrogen would also comprise silicon when formed from these materials. Hence, it is unclear how the cited portion renders antecedent support for the claimed subject matter.

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7. The following is a quotation of the second paragraph of 35 U.S.C. 112:
8. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
9. Claims 83 and 84 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
10. Regarding Claim 83, it is unclear what is meant by the term "silane." It is unclear whether this refers to the molecule " SiH_4 ", whether it refers to silicon analogs of hydrocarbon molecules, or to something else.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
 1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
13. Claims 28, 31, 32, 35, 36, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slutz et al. USPN 5,387,447 in view of Kopidakis et al.

in "Hydrogen-induced structural changes . . ." Phys. Rev. B, Vol. 58, No. 21.

Slutz teaches a tubular structure having an interior surface formed of carbon film that is from 1 to 2000 microns in thickness of a high degree of uniformity, wherein the tube achieves the claimed aspect ratios. See Slutz (col. 3, line 53 through col. 4, line 61; col. 5, lines 35-51; and col. 6, line 40 through col. 8, line 3).

Applicant's specification does not teach that the claimed hardness levels require special manufacturing conditions. As such, the claimed hardness levels can be presumed to be inherently present in material characterized as similar to that under examination, namely amorphous carbon coating, absent a showing otherwise. With respect to those claims that specify that the coating is amorphous carbon coating, they may be presumed to encompass the CVD diamond coating of Slutz since both are formed by similar starting materials, namely hydrocarbons, and since artificial diamond coatings are frequently referred to as amorphous carbon coatings. Slutz et al. does not teach the presence of 32 atomic percent of hydrogen. Kopidakis et al. teaches that including varying amount of hydrogen in coatings of the type formed by Slutz renders variation in film properties such as hardness. See Kopidakis et al. (Abstract; page 14 106, left column; page 14 109, entire page). It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the amount of hydrogen in the layer of Slutz in order to tailor the layer properties, such as hardness properties, of Slutz to the particular uses to which Slutz's layers are intended, and to form layers having the claimed amounts of hydrogen,

which are described by Kopidakis et al., in order to achieve desired layers having the desired properties, including degree of hardness, corresponding to this amount of hydrogen content.

Response to Amendment

14. In view of applicant's amendments, applicant traverses the claim objection of the Office Action mailed on 15 May 2007. Objections are withdrawn.

15. In view of applicant's amendments, applicant traverses the section 102 rejection over Slutz of the Office Action mailed on 15 May 2007. Rejection is withdrawn.

16. In view of applicant's amendments, applicant traverses the section 103 rejection over Bokros in view of Bokros of the Office Action mailed on 15 May 2007.

Rejection is withdrawn.

Allowable Subject Matter

17. Claims 45, 48, 49, 51-54, 56, 57, 60, 61, 63, 66, 67, 73, and 85-92 are allowed.

18. Claims 83 and 84 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion


19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael La Villa whose telephone number is (571) 272-1539. The examiner can normally be reached on Monday through Friday.

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20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael La Villa
14 October 2007


MICHAEL E. LAVILLA PH.D.
PRIMARY EXAMINER